APPENDIX A

"CLEAN" VERSION OF EACH PARAGRAPH/SECTION/CLAIM
37 C.F.R. § 1.121(b)(ii) AND (c)(i)

CLAIMS (*with indication of amended or new*):

(New) 26. A radiation source comprising a frequency conversion member configured to emit a beam of emitted radiation in response to irradiation with an input beam with a frequency different to that of the emitted radiation, the source being subjected to a magnetic field wherein the free carrier concentration of the frequency conversion member and the applied magnetic field is configured such that the cyclotron diameter of the free carriers of the frequency conversion member is within 30% of their scattering length.

(New) 27. A radiation source comprising a frequency conversion member configured to emit a beam of emitted radiation in response to irradiation with an input beam having a frequency different to that of the emitted beam of radiation, the source being subjected to a magnetic field, the magnetic field and fluence of the input beam being configured to minimize the screening effect of free carriers in the frequency conversion member.

(New) 28. A radiation source comprising a frequency conversion member configured to emit a beam of emitted radiation in response to irradiation with an input beam with a frequency different to that of the emitted beam, the frequency conversion member comprises a magnetic material dopant.

(New) 29. The radiation source of claim 28, wherein the dopant is Mn.

(New) 30. A radiation source comprising a frequency conversion member configured to emit a beam of emitted radiation in response to being irradiated with an input beam with a frequency different to that of the emitted beam, the source being subjected to a magnetic field, the source further comprising means for applying an electric field at the surface of the frequency conversion member which is irradiated by the input beam.

(New) 31. The radiation source of claim 30, wherein the means for applying an electric field comprise a pair of Ohmic contacts provided to the frequency conversion member and means for applying a potential difference across said Ohmic contacts.

(New) 32. The radiation source of claim 30, wherein the Ohmic contacts have a substantially triangular shape such that the contacts taper towards one another.

(New) 33. The radiation source of claim 30, wherein the means for applying a field comprises a Schottky gate provided on the surface of the frequency conversion member which is irradiated by the input beam.

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(New) 34. The radiation source of claim 26, wherein the input beam is circularly or elliptically polarized.

(New) 35. The radiation source of claim 26, wherein the magnetic field has a component parallel to that of the emitted beam.

(New) 36. The radiation source of claim26, wherein the emitted beam is produced by reflection of the input beam off a surface of the frequency conversion member.

(New) 37. A radiation source comprising a frequency conversion member configured to emit a beam of emitted radiation in response to irradiation with an input beam with a frequency different to that of the emitted radiation, the source being subjected to a magnetic field which has a component parallel to that of the emitted beam of radiation, the emitted beam of radiation being produced by reflecting the input beam off a surface of the frequency conversion member.

(New) 38. The radiation source of claim 26, wherein the magnetic field is oriented parallel to the emitted beam.

(New) 39. The radiation source of claim 26, wherein the magnetic field is oriented at an angle of at most 20° to the emitted beam.

(New) 40. The radiation source of claim 26, wherein the frequency conversion member is selected from InAs, InSb and GaAs.

(New) 41. The radiation source of claim 26, configured such that the angle between the input beam and the surface normal of the frequency conversion member is substantially the Brewster angle.

(New) 42. The radiation source of claim 26, wherein the frequency conversion member is subjected to a magnetic field of at least 2T.

(New) 43. The radiation source of claim 26, the source further comprising a magnet to apply the said magnetic field.

(New) 44. The radiation source of claim 26, wherein the emitted radiation comprises at least one frequency in the ranges from 0.1 THz to 100THz.

(New) 45. The radiation source of claim 26, wherein the input beam is a pulsed beam.

(New) 46. a method of optimizing a radiation source, the radiation source comprising a frequency conversion member configured to emit a beam of emitted radiation in response to irradiation with an input beam with a frequency different to that of the emitted radiation.

(New) 47. A method of optimizing a radiation source, the radiation source comprising a frequency conversion member configured to emit a beam of emitted radiation in response to irradiation wit an input beam with a frequency different to that of the emitted radiation,

the method comprising the step of applying a magnetic field to the source, the fluence of the input beam being chosen in order to minimize the screening of the surface field of the frequency conversion member by free carriers in the frequency conversion member for a predetermined magnitude of the applied magnetic field.

(New) 48. The method of claim 46, wherein the magnitude of the applied magnetic field or the optical fluence is determined by the steps of:

a) measuring the power of the emitted beam as a function of optical fluence for at least three values of magnetic field;

b) fitting the data measured in a) to the relation:

$$P \propto \frac{n^2 B^2}{m^4} x \left[\frac{\cos\theta_M \sin\theta_M}{2\theta_M} + \frac{1}{2} \right], \qquad (1)$$

Claims

where P is the power of the emitted beam, n is the free carrier concentration, m is the effective mass of the carriers, B is the magnetic field and θ_M is:

$$\theta_M (n, B) = \arccos\left[1 - \frac{1}{2}\left(\frac{\lambda}{r}\right)^2 \right], \qquad (2)$$

where λ is the mean free path which is defined as ½($n^{-1/3}$) and r is the cyclotron radius;

c) determining the fluence values for the at least three values of magnetic field where with increasing fluence the measured power starts to diverge from the function of step b); and

d) fitting an exponential function to the at least three values determined in point c) such that the optimum fluence can be determined for a given magnetic field or an optimum magnetic field can be determined for a given fluence.